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THIS IS UNEVALUATED INFORMATION

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[redacted]

1. The Moscow Electric Bulb Factory No. 591 (Moskovskiy Elektrokolbochnyy Zavod No. 591) is located at 29 Smirnovskaya Street, Zhdanovskiy Rayon, Moscow. It is under the control of the Ministry of Communications Equipment Industry, 2/10 Bolshoy Cherkassovskiy Pereulok, Moscow. A branch line connects the factory with the goods station of the Moscow - Kursk railway. The factory is connected with the town by streetcars [redacted] busses [redacted] and trolleybus [redacted]

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2. The factory was founded in 1924. Prior to this, electric glass bulbs had been produced mainly by the Zaprudnenskiy Glass Works, which employed modern mechanized methods of production. Other factories engaged on the production of electric bulbs included the Druzhnaya Gorka Factory (59-18N, 30-08E), situated in the Leningrad Oblast, which supplied the Leningrad Svetlana Factory. This factory used the same methods and glass compositions as the Zaprudnenskiy Glass Works, and these methods were also adopted by the Moscow Electric Bulb Factory when it came into being.[1]

3. In 1927 the factory entered the newly formed Elektrokombinat, which supplied bulbs to the Moscow Electric Lamp Factory of the same combine.[2] At this time the Moscow Electric Bulb Factory was producing up to 40,000 glass bulbs every 24 hours for standard electric lamps.

4. In 1940-1941 the factory produced glass bulbs for standard electric lamps of various power, glass tubing (drotovoye steklo), moldings (shtabik), glass sticks (steklyanaya palochka), and stems (shtengel), as well as refractory glass bulbs for various purposes. At this time the Standard Electric Bulb Shop was the largest shop in the factory. It had 160 qualified glass-blowers (vyduvalshchik), 80 knockers-off (otshibalshchik), and about 60 subsidiary workers. Bulbs were blown by hand and the shop produced 105,000 bulbs per 24 hours.

5. At the outbreak of WW II most of the personnel and equipment were evacuated, and the personnel remaining carried out their normal employment to meet service requirements. New equipment was installed in the evacuated part of the building, fresh workers were recruited, and armament work of a different nature was undertaken.

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6. In 1945 the factory reverted to pre-war production. Eight million rubles were allotted for reconstruction and a new spacious building, in which new equipment was installed, was erected for the Standard Electric Bulb Shop.

7. The types of production are as follows:

a. Bulbs of various sizes for normal lighting purposes.
b. Refractory glass bulbs for powerful lamps, searchlights, and generator lamps.
c. Bulbs for radio amplifiers.
d. Glass tubing (tubes, sticks, and stems).
e. Tubes for daylight lamps.
f. Glass consumer goods.

8. The output is as follows:

a. Standard lighting bulbs:
1946 - about 7,000,000 bulbs,
1951 - about 40,000,000 "

b. Refractory glass bulbs for powerful standard lamps, searchlight lamps, and generator lamps:
1951 - about 4,400,000 bulbs.

c. Bulbs for radio amplifiers:
1951 - about 7,000,000 bulbs.

d. Glass tubing (drotovoye steklo):
1951 - about 520 tons.

e. Tubes for daylight lamps:
1951 - about 1800 tons.

Factory Shops

9. The Standard Electric Bulb Shop (Tsekh Normalno-Osvetitelnykh Lamp) is one of the more important shops belonging to the factory. In 1945 a new glass-melting bath furnace with a capacity of up to 120 tons of molten glass was installed in the shop. The rotary automatic machines, each of which had a theoretical cutting capacity of up to 75,000 bulbs per 24 hours, were installed on the platform in front of the bath furnace. Each of these machines has six sections, each with four blow pipes. During one turn of the machine the vacuum feed performs six working cycles. The feeder sucks molten glass from the bath in small portions into the molds of the automatic machine. Each portion of molten glass is distributed among the molds of one section of the automatic machine; the glass in each mold is filled with compressed air; and, after a lapse of time, the hardened bulbs are ejected onto the conveyer. The bulbs are then taken to the rotary automatic cutting machine, which simultaneously cuts off the cap (kolpak) of the bulb by means of a flame and flashes off the neck of the bulb. Next the bulbs are fired in conveyer-type muffle-tunnel furnaces about 7 meters long, after which they pass through a cooling conveyer. The bulbs are finally checked and packed prior to dispatch to electric lamp factories.

10. The rotary automatic machine can only produce one type and size of bulb at a time. Before switching over to the manufacture of another type of bulb, it is necessary to change the molds, composition heads (nabornaya golovka), and blow pipes and to carry out small adjustments in the machine. The replacement of parts such as tubes, molds, and valves in the machine can be carried out without difficulty while the machine is still working. All regulating valves are easily accessible. Adjacent to the automatic machines are control boards for regulating conveyers and electrical appliances. The rotating movement of the automatic machines is started by means of a knife switch.

11. Some considerable time elapsed after the introduction of the automatic machines before they were finally mastered. Failures and breakdowns were frequent. It was not until the middle of 1948 that the machines were running at full capacity.

12. Electro-mechanical telpher line leaders travel below the ceiling and round and above the bath furnace. In 1945 the shop was equipped with a large tank for storing mazout which was the fuel used by the furnace. The tank was built in a large basement which also contained equipment for such functions as controling the furnace, feeding compre air, softening the water used for cooling the vacuum-feeding head, and feeding hot ai into the furnace. The basement also contained special furnaces for firing refractory materials required for the factory furnaces. While building the storage tank, great difficulty was experienced with subterranean water.

13. At the end of 1947 the factory built a pipeline about 3 km long to enable Saratov gas to be introduced into the factory. Gas was then substituted for mazout and this enab glass of a superior quality to be produced at a quicker rate and at less cost.

14. The construction of the shop and its equipment was supervised by Giproenergoprom (State Institute for Drawing up Plans for the Power Industry). The shop has a branch railway line.

15. The Refractory Glass Shop (Tsekh Tugoplavkogo Stekla) produces refractory glass for bulbs for electric light lamps up to 50 cm, for searchlight projector lamps, for gene tor lamps, and for various types of radio tubes. Before and during the war, melting refractory glass was done in potters' kilns (gorshkovaya pech) which were fired with mazout. These kilns were small and worked intermittently. The average production pe square meter of furnace hearth was 40-50 kg. of finished glass. The time required for melting was 40-44 hours. Blowing of bulbs was done by hand.

16. In 1945, at the conclusion of hostilities, the factory director, in conjunction with chief engineer, Slivinskiy; the chief designer, Kudryavtsev; and the chief power engine (glavnyy energetik), Atanasyan; designed and built an experimental furnace operated by electricity. The furnace, which had two large electrodes for passing the current, wa built of large chamotte slabs and fire-bricks. Near the furnace there was a transfor for regulating the voltage dependent on the rate of melting. The transformer could increase the voltage to 600 volts. For measuring the temperature of the furnace, a porcelain tube with a thermocouple composed of two refractory metal wires welded toge was passed from above into the crown of the furnace; a special galvanometer indicated the voltage resulting from the heating of the two welded wires. The galvanometer was so graduated that 6 milli-volts represented approximately 600° of molten glass. The galvanometer registered heat up to 1500°C. The furnace was started by pouring in mol glass from another furnace in order to cover up the electrodes, after which the furna charge (shikhta) and broken glass were introduced and the furnace put into operation. When the glass had been melted, a portion was drawn off at a temperature of 1500° through a special aperture at the bottom of the furnace and a new charge and broken g put into the furnace.

17. In 1946 the factory built an electric furnace capable of producing one ton of refract glass every 48 hours. Furnaces were also built for the factory by the Electric Furna Trust, which later installed similar furnaces at the Svetlana Factory, Leningrad, the Moscow Electric Lamp Factory and the Moscow Technological Institute i/n Kaganovich, wh belongs to the Ministry of Light Industry. At the end of 1949 the factory built a new continuous-action glass-melting furnace, which operated continuously for a year, after which it was overhauled. The capacity of the furnace is about 11 tons. Produc of refractory glass during 24 hours exceeds 1 ton.

18. The early electric furnaces developed defects which resulted in inadequate cooling, partial dissolution of the iron electrodes into the glass mass, and the glass produce being somewhat clouded. The furnaces were reconstructed and the defects eliminated.

19. In addition to the electric furnaces there are several potter's kilns for melting spe glass. Each kiln produces 100 kg of glass in one melting operation. These kilns now use gas fuel in place of mazout.

20. The Glass Tubing Shop (Tsekh Drotovogo Stekla) produced glass tubing, including glass sticks and stems. They are produced at the factory on a machine designed by S.I. Korolev. The working principle of this machine is identical with that of the Forcauld machine. This machine produces tubing from 2 to 30 mm in dimaeter and also sticks (shtabik). The speed of tube drawing varies from 1.5 to 20 meters per minuts, depending on the diameter of the tubing. During a shift of 8 hours, the machine will produce 600 kg of tubing exclusive of rejects. In this machine, glass from the bath furnace enters a working canal (rabochiy kanal), which is divided by chamotte bridges into alternating preheating and machine chambers. On the surface of the glass mass in each machine chamber rides a small chamotte boat (Shamotnaya Lodochka) with two round apertures which is partly submerged in the glass mass. This boat is used for drawing sheet glass. The boat for drawing sticks is identical, except for the shape of the aperture, which corresponds to the glass sticks drawn and may be any shape, such as round, square, or oval. The boat used for tube drawing has a core nipple inside the aperture for molding the hollows of the tube which is being drawn. The diameter and thickness of the tubes are regulated by changing the size of the aperture and nipple of the boat, the depth to which the boat is submerged, the pressure of the air blown through the nipple, and the speed of drawing.

21. The Daylight Lamp Tube Shop (Tsekh Trubok Dnevnogo Sveta) produces glass tubes for daylight lamps on a horizontal drawing machine built by the Moscow Steklomashina Factory. This machine produces tubes from2 to 80 mm and sticks up to 30 mm. The diameter and thickness of the walls of the tubes are regulated by altering the amount of glass fed, the air pressure, and the speed of drawing. The machine produces in one shift 1 to 1.5 tons of tubing of one size. There are very few rejects on this machine.

22. Other factory shops are as follows:

a. Large Lighting Bulb and Searchlight Bulb Shop (Tsekh Kolb Krupnykh Osvetitelnykh Lamp i Prozhektornykh Lamp).

b. Generator Lamp Bulb Shop (Tsekh Kolb Generatornykh Lamp).

c. Radio Amplifier Bulb Shop (Tsekh Kolb Usilitelnykh Radiolamp).

d. Consumer Goods Shop (Tsekh Shirpotreba).

Glass Composition

23. Prior to 1929 the factory manufactured bulb glass from Formula No. 10, which has a lead oxide content. This glass is composed of SiO_2 - 73.33 percent, PbO - 5.37 percent, CaO - 4.15 percent, K_2O - 6 percent, and Na_2O - 11.15 percent.

24. When continuous glass melting in bath furnaces was started, the presence of lead oxide in the glass altered the nature of the glass, which became subject to lamination. As a result of this, the factory started to manufacture bulb glass from Formula No. 55, which was free from lead. This glass is composed of SiO_2 - 72.81 percent, CaO-5.42%, MgO - 3.36 percent, NaO - 11.44 percent, K_2O - 0.78 percent, and Al_2O_3 - 1.19 percent.

25. Prior to the war the factory manufactured glass from Formula No.71. This glass is composed of SiO_2 - 72.49 percent, BaO - 1.43 percent, CaO - 5.36 percent, MgO-3.5%, K_2O - 1.33 percent, and Na_2O - 15.89 percent. In 1947 the factory manufactured glass from Formula No. 82, which differs slightly from Formula No. 71.

26. Platinite is used for the manufacture of lead-ins (vvod) for mass-produced bulbs such as standard small power bulbs and ordinary radio tubes. The coefficient of expansion of these bulbs and tubes is approximately that of the expansion of platinite.

27. For the production of so-called weight glass (vesovoye steklo) such as tubes, sticks, and stems for electric lamp legs and other purposes, the factory, for more than 20 years without interruption, has been manufacturing glass with a small lead content from Formula No. 16. This glass is composed of SiO_2 - 69.59 percent, PbO - 10.20 percent, CaO - 3.94 percent, K_2O - 5.68 percent, and Na_2O - 10.59 percent.

28. Glass is also manufactured from Formula No. 59, which is made up as follows: SiO_2 - 65.78 percent, PbO - 16.12 percent, CaO - 1.84 percent, K_2O - 7.85 percent, and Na_2O - 8.41 percent. During the last three years several more glass compositions have been used. For producing tubes for daylight lamps, ordinary glass made from a composition of calcium and magnesium is used. For mercurial bactericidal lamps, tubes are made either of calcium-magnesium glass or of boron-silicon glass. The lamp walls are 0.5 mm and the iron-oxide content does not exceed 0.01 percent.

29. The designation weight glass applies to such products as glass tubes, sticks, and stems, as their output is calculated by weight in kilograms or tons. Glass bulbs, sometimes called balloons, belong to the piece glass category and their output is given in figures.

Personnel.

30. Below is given a list of the more important employees.

Factory Director	Adamyan,
Chief Engineer	Slivinskiy,
Chief Designer	Kudryavtsev,
Chief Power Engineer	Atanasyan,
Head of the Factory Laboratory	Ponomareva,
Head of the Refractory Glass Shop	Romanova,
Head of the Consumer Goods Shop	Kotov.

31. The approximate number of workers in 1948 was 1600. Work is conducted in three shifts.

32. The factory works in close conjunction with the Zaprudenskiy Electric Bulb Works No. 593. Since 1951 the latter factory has added standard lighting bulbs to the types of bulbs previously produced, and it is probable that in the very near future it will also produce radio tubes.

1. [redacted] 50X1-HUM Comment: This factory has been referred to as the Zaprudanya Glass factory (56-34N, 37-26E) in previous reports.

2. [redacted] 50X1-HUM Comment: This combine has been referred to in other reports as the Elektrozavod.